Waste Resources
a WRT company

Waste Resources, Inc.

Installation of CNG Fueling Station

MSRC Contract #MS14079 / MS14079B

FINAL REPORT

Project Installed for:
Waste Resources, Inc.
Los Angeles

Date:
March 1, 2021

Prepared for the Mobile Source Air Pollution Review Committee (MSRC) under the AB 2766 Discretionary Fund Work Program

Acknowledgements

Waste Resources (WR) would like to acknowledge the following key personnel and organizations that were associated with this project:

- Mobile Source Air Pollution Review Committee (MSRC) for partnering with WR through grant funding.
- Matthew Mackenzie and Cynthia Ravenstein of the MSRC for their diligence in bringing this project before the MSRC Committee for approval.
- Tommy Gendal, WR's Chief Operating Officer, for initiating this project to support its clean fuel fleet.
- Michelle Nicholls of Waste Resources for successfully managing the completion of this project.
- Reb Guthrie and Faye Farahmand of Fuel Solutions for designing the fueling system and assisting throughout the permit process.
- Jeff Kindness of KGC General Contractors who guided this project through permitting and construction.
- Jeff Latham and Tom Wyper of Fueling and Service Technologies (Fastech) for completing the installation.
- The Gas Company for their support of the gas supply upgrades required for this project.
- City of Los Angeles for their cooperation in the approval of the fueling station's plans, building permits, and electrical upgrade.

This report was submitted in fulfillment of Contract #MS10479 and 10479B and Installation of CNG Fueling Station by Waste Resources under the partial sponsorship of the Mobile Source Air Pollution Reduction Review Committee (MSRC). Work was completed as of December 31, 2020.

Disclaimer

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Appendices

Project Description & Work Performed

This project installed a new compressed natural gas (CNG) fueling station at Waste Resources' (WR) facility at 850 E. 111th Place, Los Angeles, with a three-compressor system using Sauer compressors and custom system design. The completed project has a total capacity of 288 SCFM (standard cubic feet per minute). There are 16 time-fill dispensers and one fast-fill dispenser. This station is for WR's use only and is not open to the public.

WR's collection fleet is 100% CNG and there are no public fueling stations near the facility or daily collection routes. The purpose of adding an onsite fueling station was threefold:

1. To provide a conveniently located and reliable source of CNG for WR's collection fleet.
2. To decrease emissions to and from public fueling stations that are out of the way from the facility or daily collection routes.
3. To decrease traffic congestion at public fueling stations that are often very busy.

WR worked with Fuel Solutions, Fastech, and KGC General Contractors to plan, design, and install the final fueling station and nozzles. Other entities were included when necessary for the successful completion of this project.

The initial project was designed so that only two compressors would run at a time, but the addition of more trucks to the fleet necessitated an increase in gas supply and electrical upgrades from 2019-2021, which now allows for all three compressors to run at once, cutting down on fueling time so that most of the fleet can be fueled overnight.

The final design includes:

- 3 Sauer WP 4351 4-stage 75hp compressors
- Dryer
- Storage tanks for use by the fast-fill dispenser
- 16 time-fill hoses
- One fast-fill hose

All required permits were obtained, and all local and state codes were adhered to throughout the installation. The fuel system is located on a secure site and is protected by k-rails and bollards. Plans include the addition of a canopy and fencing in the future.

Construction began in earnest in May 2019, with substantial completion in September 2019. Work included earth work and new concrete, plus installation of new electrical panels, conduit, pipes, and wiring. Commissioning of the initial system was completed in January 2020. The upgraded system was completed in February 2021.

The new and completed system can fuel 16 vehicles at one time using a time-fill process and one vehicle using a fast-fill process.

Problems Encountered

This project faced many challenges with the original contractor, resulting in the re-bid and subsequent award to Fastech in 2019. With Fastech and WR's civil contractor, KGC, working together, they were able to take the original design and modify it so that a successful system could be installed and operated reliably.

Additional civil and structural work was required to manage poor soils conditions discovered after digging and trenching began.

Since the time the original grant was awarded, WR's CNG fleet has grown to 50 collection vehicles that require daily fueling. The original design called for only two of the three compressors to be running at a time. However, with the increased need for fueling capability, the gas supply and electrical service were insufficient to operate the system. The electrical upgrade was completed in 2020 and the gas service in 2021.

Coordinating logistics and changes between the different agencies proved to be difficult and time consuming. Due to this, and the original contractor's failure to perform, the project encountered significant delays, which resulted in an adjustment to the contract period.

Project Timeline

- 12/11/14 - Grant award letter received.
- 9/9/16 - Submitted 1st request for contract time extension and revised equipment list.
- 10/20/16 - Initial contract executed.
- 6/16/17 - Amendment A of contract executed.
- 10/26/18 - Submitted 2nd request for contract time extension.
- 2/2019 - Civil work commenced.
- 3/21/19 - Amendment B of contract executed.
- 4/5/19 - Installation contract put on hold.
- 4/12/19 - Installation contract terminated.
- 4/29/19 - Installation work commenced with new contractor.
- 9/27/19 - Startup of system with original configuration (2 compressors).
- 10/20/20 - Electrical upgrade completed.
- 2/1/21 - Gas upgrade completed. Can now run 3 compressors at one.
- 2/13/24 - Contract term ends.

Emissions Benefits

The installation of this system has reduced on-road fleet hours by an average of 832 hours per month for the 32 trucks that use the station (16 fills with one vehicle swap overnight). This has decreased traffic congestion on the route to and from public fueling stations, as well as wait times at local public fueling stations.

The original application planned to fuel 12 trucks at a tlme on a time-fill basis. The final project fuels 16, further reducing on-road fleet hours.

The original application estimated at least 179,712 diesel gallon equivalents (DGE) would be dispensed by the third year of operation. This estimate was based on 12 trucks (48 DGE each) fueling once a day, six days a week:

48 DGE * 1 fueling/day * 312 days/year * 12 trucks = 179,712 DGE

179,712 / 12 = 14,976 DGE/year/truck

The project dispensed 44,049 DGE in its first four months of operation and 243,969 DGE in its first full year of operation (2020), removing an equal amount of diesel and gasoline emissions from the environment:

243,969 / 16 trucks = 15,248.06 DGE/year/truck

Additionally, WR has partnered with US Gain to purchase renewable natural gas for the station's use, further reducing emissions associated with the extraction and supply of traditional natural gas.

Photographs & Outreach

See Appendix A for photos of the station and outreach related to this project.

Summary and Conclusions

WR's new CNG fueling infrastructure helps us further embrace CNG over the diesel engine platform that characterized local fleets a decade ago. This project made is possible for WR to support its clean-burning near zero CNG fleet with cleaner burning CNG fuel and trucks.

The initial project was designed so that only two compressors would run at a time, but upgrades were made to the gas and electricial supply during the grant term such that all three compressors can run at once, cutting down on fueling time so that most of the fleet can be fueled overnight.

The new and completed system can fuel 16 vehicles at one time using a time-fill process and one vehicle using a fast-fill process.

The installation of this system has reduced on-road fleet hours by an average of 832 hours per and dispensed 243,969 DGE in its first full year of operation (2020), removing an equal amount of diesel and gasoline emissions from the environment.

APPENDIX A

Photographs & Outreach

Photographs

Picture 1. Station, looking southwest

Picture 2. Station, looking northeast

Picture 3. Fill posts, looking south

Picture 4. Fill posts, looking north

Press Release

https://wasteresources.com/news-from-the-yard/

Waste Resources
a WRT company

--March 1, 2021 - Los Angeles, California--

Waste Resources has completed the installation of a new compressed natural gas (CNG) fueling station at its Los Angeles site. This station services its fleet of clean-fuel waste collection trucks. These trucks serve the communities of Carson, Gardena, Glendale, Hawaiian Gardens, Lynwood, Torrance, and areas of Unincorporated Los Angeles County.

The quality of the LA basin's air is an everyday concern for all our communities. Converting just one truck from diesel to natural gas is the pollution equivalent of taking 325 cards off the road. Clean air is very important for long-term sustainability and the quality of life for everyone. Environmentally friendly, CNG is the cleanest burning transportation fuel on the market today. They produce 20-29% fewer greenhouse gas emissions than comparable gasoline or diesel fueled vehicles. Additional benefits include longer vehicle life and less noise pollution. Plus, Waste Resources' trucks are even cleaner than typical CNG trucks on the road thanks to Near-Zero emission technology incorporated in its newer fleet. These trucks' exhaust emissions are 90% lower than the current EPA NOx limit of 0.2g/bhp-hr.

"We are so pleased that the MSRC partnered with us to make this station happen for our fleet and our community," said Michelle Nicholls, Vice President of Environmental Affairs and Development. "Our ability to fuel the fleet with clean air technology at our own facility is just one more way Waste Resources helps make today's waste tomorrow's resource."

A significant financial contribution for the project was provided by a grant from the Mobile Source Air Pollution Reduction Review Committee (MSRC) through the Clean Transportation Funding program.

About Waste Resources - Waste Resources is an integrated waste collection, recovery, and conversion company that is at the forefront of developing innovative technologies to divert more resources from landfills through its recycling capabilities in the greater Los Angeles area. Through its municipal partners, Waste Resources is committed to transforming solid waste management into sustainable resources such as recycled-content feedstock, renewable natural gas, baseload electricity, and natural soil amendments.

Website Post

Waste Resources
a WRT company

WR Announces New Fueling Station

MSRC Press Release

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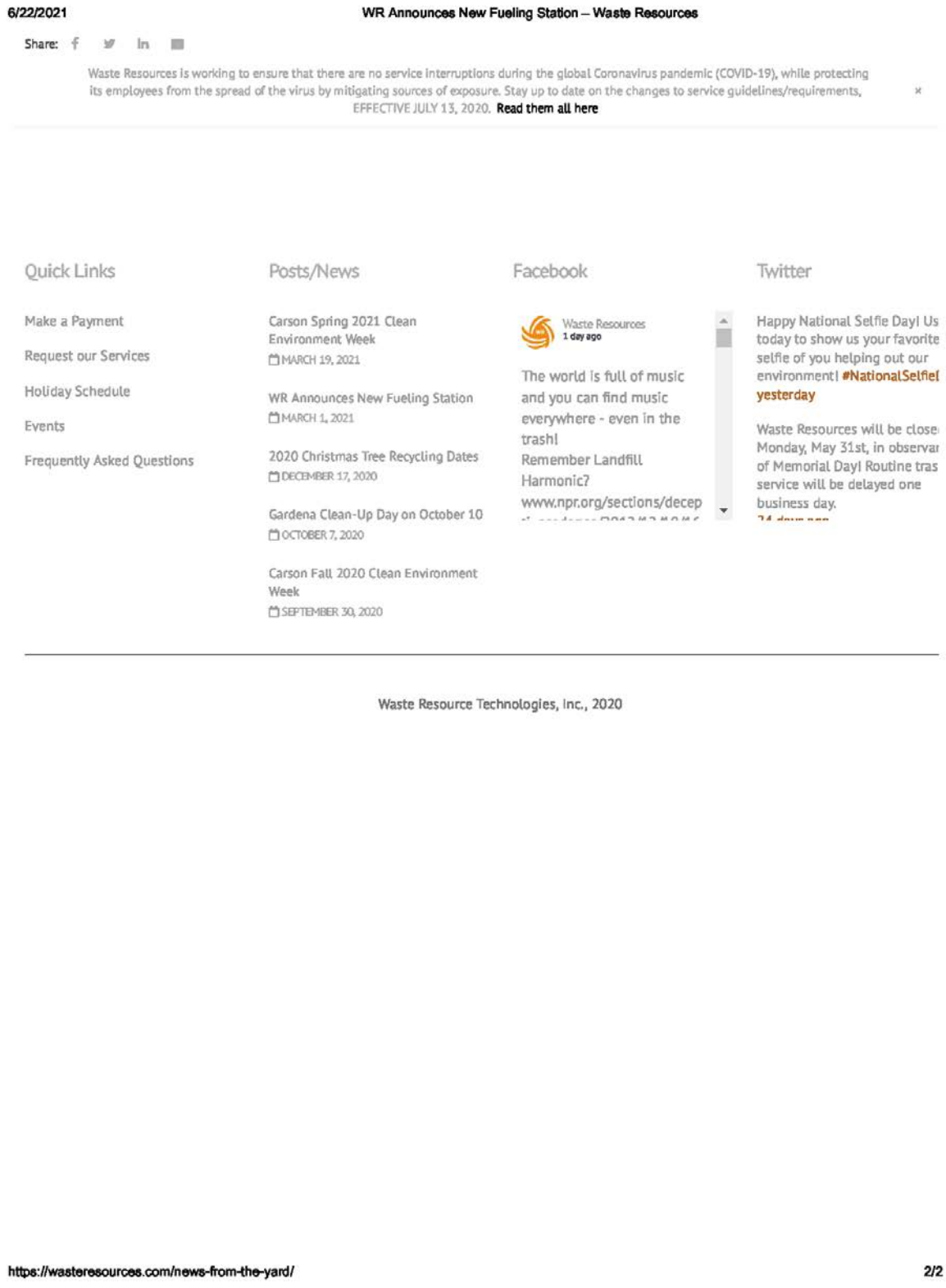


6/22/2021 WR Announces New Fueling Station – Waste Resources

Share:

Waste Resources is working to ensure that there are no service interruptions during the global Coronavirus pandemic (COVID-19), while protecting its employees from the spread of the virus by mitigating sources of exposure. Stay up to date on the changes to service guidelines/requirements, EFFECTIVE JULY 13, 2020. **Read them all here**

Quick Links

Make a Payment

Request our Services

Holiday Schedule

Events

Frequently Asked Questions

Posts/News

Carson Spring 2021 Clean Environment Week
MARCH 19, 2021

WR Announces New Fueling Station
MARCH 1, 2021

2020 Christmas Tree Recycling Dates
DECEMBER 17, 2020

Gardena Clean-Up Day on October 10
OCTOBER 7, 2020

Carson Fall 2020 Clean Environment Week
SEPTEMBER 30, 2020

Facebook

Waste Resources
1 day ago

The world is full of music and you can find music everywhere - even in the trash!
Remember Landfill Harmonic?
www.npr.org/sections/decep

Twitter

Happy National Selfie Day! Us today to show us your favorite selfie of you helping out our environment! #NationalSelfie yesterday

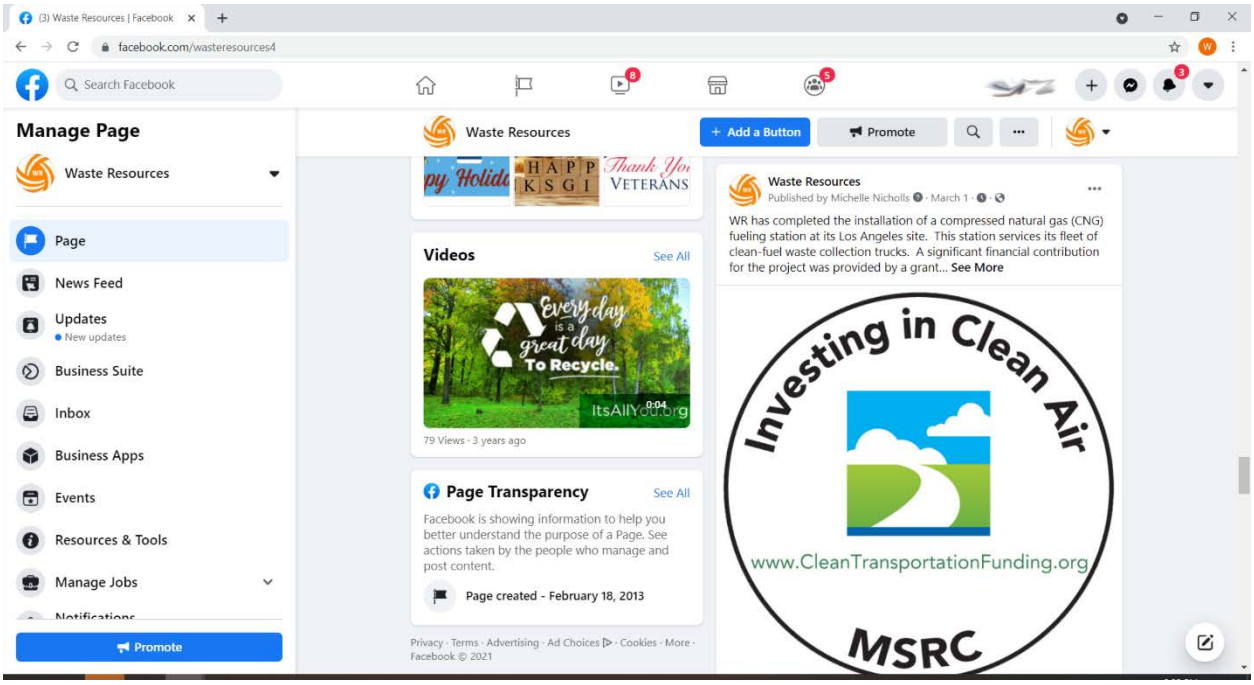
Waste Resources will be close Monday, May 31st, in observar of Memorial Day! Routine tras service will be delayed one business day.

Waste Resource Technologies, Inc., 2020

https://wasteresources.com/news-from-the-yard/ 2/2

Social Media Posts

Facebook



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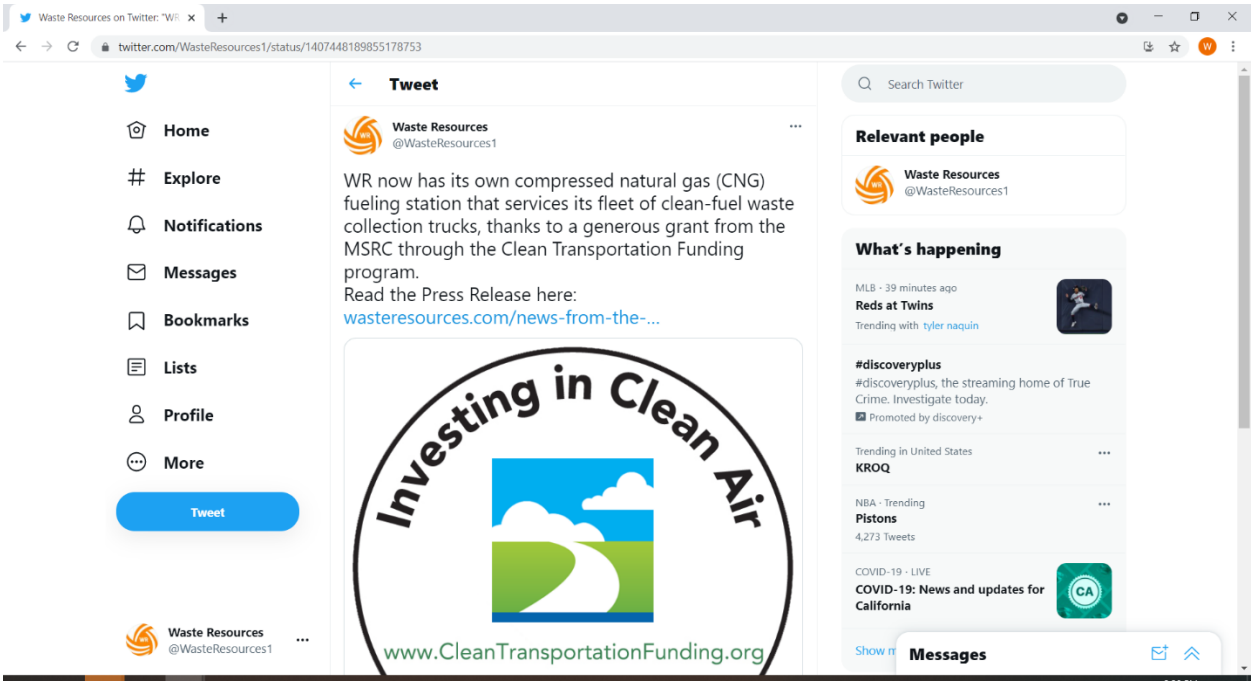

Brochure

The Fall issue of WR's residential services brochure will be issued around September 2021. A notice regarding the grant will be included at that time. Conceptually, the notice will read as follows:

Did You Know?

WR recently completed the installation of a new compressed natural gas (CNG) fueling station at its Los Angeles yard, which services a fleet of 50 clean-fuel waste collection trucks. Converting just one truck from diesel to natural gas is the pollution equivalent of taking 325 cards off the road. Over the past few years, we've completely replaced all of our collection trucks with Near Zero CNG technology, which are even cleaner than typical CNG trucks.

With a generous grant from the Mobile Source Air Pollution Reduction Review Committee (MSRC) through the Clean Transportation Funding program, this is one more way WR helps make today's waste tomorrow's resource.